



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/589,091

06/05/2007

Uwe Schierhorn

06-479

5492

34704 7590 01/25/2012

BACHMAN & LAPOINTE, P.C.

900 CHAPEL STREET

SUITE 1201

NEW HAVEN, CT 06510

EXAMINER

KOAGEL, JONATHAN BRYAN

ART UNIT

PAPER NUMBER

3744

MAIL DATE

DELIVERY MODE

01/25/2012

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/589,091	Applicant(s) SCHIERHORN, UWE	
	Examiner JONATHAN KOAGEL	Art Unit 3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 October 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☒ Claim(s) 14-19 is/are pending in the application.
- 5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 14-19 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 14, 15 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et al. US Patent No. 6,131,401 and Utsumi US Patent No. 6,012,294.

Regarding claim 14, Ueno teaches in fig. 1, a refrigeration installation having at least one refrigeration consumer 10, 20 which includes at least one evaporator 16, 26, having at least one feed line (See annotated figure below) and at least one discharge line (See annotated figure below), via which a refrigerant is fed to the at least one refrigeration consumer 10, 20 and discharged from the at least one refrigeration consumer 10, 20, the at least one refrigeration consumer 10, 20 having expansion members 15, 25, each said refrigeration consumer 10, 20 being assigned a linear compressor 14, 24. Ueno fails to explicitly teach the expansion members being designed as switchable expansion valves which are switchable between a first working position for normal refrigerating operation and a second working position for defrosting operation wherein, the refrigerant flowing through the expansion member is expanded when the expansion member is in the first working position and the pressure drop of the refrigerant flow passing through the expansion member is less than in the first working position when the expansion member is in the second working position.

However, Utsumi teaches in fig. 2, an expansion member 5 that is designed as a switchable expansion valve which is switchable between a first working position for normal refrigerating operation and a second working position for defrosting operation wherein, the refrigerant flowing through the expansion member is expanded when the expansion member is in the first working position and the pressure drop of the refrigerant flow passing through the expansion member is less than in the first working position when the expansion member is in the second working position (column 6 lines 3-14). It is being interpreted that the pressure drop of the refrigerant flow passing through the expansion member is less than in the first working position when the expansion member is in the second working position, since most of the refrigerant flows through the bypass line when in a defrosting operation. In this condition very little refrigerant flows through the expansion member and will not be expanded as much as if there were all of the refrigerant passing through the expansion member.

It would have been obvious to a person of ordinary skill in the art at the time of invention to modify Ueno with the teachings of Utsumi to include an expansion member that is designed as a switchable expansion valve which is switchable between a first working position for normal refrigerating operation and a second working position for defrosting operation wherein, the refrigerant flowing through the expansion member is expanded when the expansion member is in the first working position and the pressure drop of the refrigerant flow passing through the expansion member is less than in the first working position when the expansion member is in the second working position that would replace the expansion members of Ueno in order to prevent the indoor

Art Unit: 3744

environment (inside of refrigeration consumers) from being degraded (Utsumi column 6 lines 1-2). This is due to the short amount of time needed for a defrost cycle to occur.

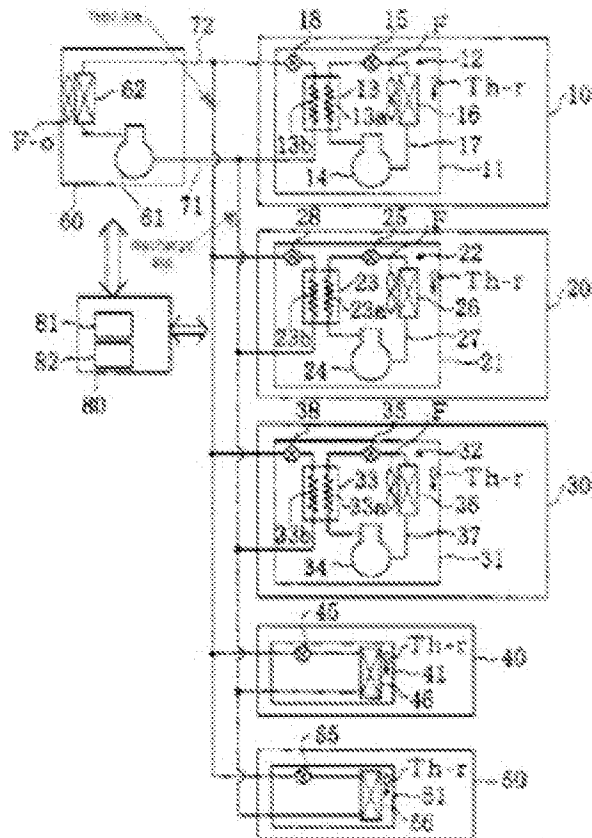


Fig. 1

Regarding claim 15, Ueno as modified above teaches the invention as disclosed and Ueno further teaches in fig. 1, wherein the at least one refrigeration consumer 10, 20 has a dedicated closed refrigerant cycle 12, 22, the refrigerant cycle 12, 22 being operatively connected via at least one liquefier 13, 23 to the at least one feed line and

Art Unit: 3744

the at least one discharge line, the refrigerant cycle 12, 22 in each case having expansion valves 15, 25 and linear compressors 14, 24, and the evaporator 16, 26 of said at least one refrigeration consumer 10, 20 in each case being arranged higher than the liquefier 13, 23 of the said at least one refrigeration consumer 10, 20 (column 4 lines 1-11, column 5 line 13-column 6 line 57). From a horizontal reference point of view in fig. 1 where a left direction is defined as a lower point and a right direction is defined as a higher point, the evaporator is arranged higher than the liquefier.

Regarding claim 19, Ueno as modified above teaches the invention as disclosed Ueno further teaches in fig. 1, a method for operating a refrigeration installation comprising providing a plurality of refrigeration consumers 10, 20, assigning at least one refrigeration consumer 10, 20 expansion members 15, 25 and linear compressors 14, 24. Utsumi teaches in fig. 2, during a defrosting phase of a refrigeration system, moving at least one of the expansion members 5 of the refrigeration system which is to be defrosted from the first working position into the second working position in which through-flow with a less pressure drop than in the first working position is possible (column 6 lines 3-15). Once Utsumi is combined with Ueno, the defrosting phase of at least one of the refrigeration consumers will occur by moving the expansion members of the consumers from the first working position into the second working position in which through-flow with a lower pressure drop than in the first working position would be possible.

Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno and Utsumi as applied to claim 14 above, and further in view of Fixemer US Patent No. 5,752,726.

Regarding claim 16, Ueno as modified above teaches the invention as disclosed and Ueno further teaches in fig. 1, wherein a plurality of refrigeration consumers 10, 20 are connected to the at least one feed line and the at least one discharge line. Ueno fails to explicitly teach the connection is by means of couplings.

However, Fixemer teaches in fig. 1 a quick-action coupling for a refrigerant line (column 1 lines 4-10) that is particularly useful to establish a fluid-tight connection.

It would have been obvious to a person of ordinary skill in the art at the time of invention to modify the combined teachings of Ueno and Utsumi with the teachings of Fixemer to include a coupling in order to insure a proper seal between the feed/discharge lines and the refrigeration consumer, so refrigerant does not leak which would cause the compressor to become damaged from a lack of refrigerant.

Regarding claim 17, Ueno as modified above teaches the invention as disclosed and Fixemer further teaches in fig. 1, wherein said couplings are quick fit couplings (column 1 lines 4-10).

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno and Utsumi as applied to claim 14 above, and further in view of Sakamoto et al. JP Publication No. 2003-065616.

Regarding claim 18, Ueno as modified above teaches the invention as disclosed but fails to explicitly teach a supercooler as an internal heat exchanger within the refrigeration consumer.

However, Sakamoto teaches in fig. 9, a supercooler (heat exchanger 49) that serves to supercool the refrigerant that flows from the condenser (pg. 8 paragraph 42). The use of a supercooler heat exchanger will allow the temperature of the refrigerant being discharged to the evaporator to be lower, allowing the refrigeration consumer to handle a high cooling load.

It would have been obvious to a person of ordinary skill in the art at the time of invention to modify the combined teachings of Ueno and Utsumi with the teachings of Sakamoto to include a supercooler in order to obtain a very low temperature refrigerant for the purposes of supplying the evaporator of the system with this low temperature refrigerant, which allows the evaporator to be used in a cooling space with a high cooling demand. Ueno as modified by Sakamoto fails to explicitly teach more than one supercooler. However, it would have been obvious to a person of ordinary skill in the art at the time of invention to include supercoolers in the at least one refrigeration consumer, since it has been held that mere duplication of essential working parts of a device involve only routine skill in the art. The use of more than one supercooler will allow the refrigerant to obtain a very low temperature, resulting in more efficient cooling in a cooling space, as the refrigeration system will not have to operate as long to meet a cooling demand.

Response to Arguments

Applicant's arguments filed 10/24/11 have been fully considered but they are not persuasive.

In response to the applicant's argument regarding the Utsumi reference disclosing that the valve will reduce the degree of opening while in the defrosting operation which will in turn increase the pressure drop over the expansion valve, the examiner disagrees. It was noted within the rejection of claim 14 above, that it is being interpreted that the pressure drop of the refrigerant flow passing through the expansion member is less than in the first working position when the expansion member is in the second working position, since most of the refrigerant flows through the bypass line when in a defrosting operation. In this condition very little refrigerant flows through the expansion member and will not be expanded as much as if there were all of the refrigerant passing through the expansion member.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JONATHAN KOAGEL whose telephone number is (571)270-7396. The examiner can normally be reached on Monday through Friday 7:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on (571)272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Art Unit: 3744

If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. K./
Examiner, Art Unit 3744
19 January 2012

/CHERYL J. TYLER/
Supervisory Patent Examiner, Art
Unit 3744